NIST Center for Neutron Research

National Institute of Standards and Technology

Activation and Scattering Results

Scattering from LiF

Source neutrons: 5.183 Å = 3.05 meV = 763 m/s
Source X-rays: 1.542 Å = 8.042 keV
Sample in beam: LiF at 2.63 g/cm^3

1/e penetration depth (cm)		Scattering length density (10^{-6}/Å^2)		Scattering cross section (1/cm)		X-ray SLD (10^{-6}/Å^2)	
abs	0.080	**real**	2.296	**coh**	0.054	**real**	20.818
abs+incoh	0.079	**imag**	-0.012	**abs**	12.434	**imag**	-0.095
abs+incoh+coh	0.078	**incoh**	5.179	**incoh**	0.275		

Neutron transmission is 0.00% for 10000 cm of sample (after absorption and incoherent scattering).
Transmitted flux is 0.000 n/cm^2/s for a 1e8 n/cm^2/s beam.
Contrast match point: 41.1% D_2O by volume (real SLD = 2.296×10^{-6}/Å^2)

Scattering from MgO

Source neutrons: 5.183 Å = 3.05 meV = 763 m/s
Source X-rays: 1.542 Å = 8.042 keV
Sample in beam: MgO at 3.60 g/cm^3

1/e penetration depth (cm)		Scattering length density (10^{-6}/Å^2)		Scattering cross section (1/cm)		X-ray SLD (10^{-6}/Å^2)	
abs	102.061	**real**	6.014	**coh**	0.422	**real**	30.668
abs+incoh	68.689	**imag**	-0.000	**abs**	0.010	**imag**	-0.326
abs+incoh+coh	2.288	**incoh**	0.638	**incoh**	0.005		

Neutron transmission is 0.00% for 10000 cm of sample (after absorption and incoherent scattering).
Transmitted flux is 5.946e-56 n/cm^2/s for a 1e8 n/cm^2/s beam.
Contrast match point: 94.6% D_2O by volume (real SLD = 6.014×10^{-6}/Å^2)

Scattering from Fe

Source neutrons: 5.183 Å = 3.05 meV = 763 m/s
Source X-rays: 1.542 Å = 8.042 keV
Sample in beam: Fe at 7.87 g/cm^3

1/e penetration depth (cm)		Scattering length density (10^{-6}/Å^2)		Scattering cross section (1/cm)		X-ray SLD (10^{-6}/Å^2)	
abs	1.596	**real**	8.024	**coh**	0.953	**real**	59.454
abs+incoh	1.514	**imag**	-0.001	**abs**	0.627	**imag**	-7.688
abs+incoh+coh	0.620	**incoh**	1.511	**incoh**	0.034		

Neutron transmission is 0.00% for 1080 cm of sample (after absorption and incoherent scattering).
Transmitted flux is 1.783e-302 n/cm^2/s for a 1e8 n/cm^2/s beam.
Contrast match point: > 100% D_2O

Scattering from V

Source neutrons: 5.183 Å = 3.05 meV = 763 m/s
Source X-rays: 1.542 Å = 8.042 keV
Sample in beam: V at 6.11 g/cm^3

1/e penetration depth (cm)		Scattering length density (10^{-6}/Å^2)		Scattering cross section (1/cm)		X-ray SLD (10^{-6}/Å^2)	
abs	0.945	**real**	-0.320	**coh**	0.002	**real**	46.970
abs+incoh	0.702	**imag**	-0.001	**abs**	1.058	**imag**	-4.471
abs+incoh+coh	0.701	**incoh**	4.590	**incoh**	0.367		

Neutron transmission is 0.00% for 1080 cm of sample (after absorption and incoherent scattering).
Transmitted flux is 0.000 n/cm^2/s for a 1e8 n/cm^2/s beam.
Contrast match point: 3.4% D_2O by volume (real SLD = -0.320×10^{-6}/Å^2)

Scattering from V

Source neutrons: 5.183 Å = 3.05 meV = 763 m/s
Source X-rays: 1.542 Å = 8.042 keV
Sample in beam: V at 6.11 g/cm^3

1/e penetration depth (cm)		Scattering length density (10^{-6}/Å^2)		Scattering cross section (1/cm)		X-ray SLD (10^{-6}/Å^2)	
abs	0.945	**real**	-0.320	**coh**	0.002	**real**	46.970
abs+incoh	0.702	**imag**	-0.001	**abs**	1.058	**imag**	-4.471
abs+incoh+coh	0.701	**incoh**	4.590	**incoh**	0.367		

Neutron transmission is 0.00% for 108 cm of sample (after absorption and incoherent scattering).
Transmitted flux is 1.562e-59 n/cm^2/s for a 1e8 n/cm^2/s beam.
Contrast match point: 3.4% D_2O by volume (real SLD = -0.320×10^{-6}/Å^2)

Scattering from Al2O3

Source neutrons: 5.183 Å = 3.05 meV = 763 m/s
Source X-rays: 1.542 Å = 8.042 keV
Sample in beam: Al2O3 at 3.95 g/cm^3

1/e penetration depth (cm)		Scattering length density (10^{-6}/Å^2)		Scattering cross section (1/cm)		X-ray SLD (10^{-6}/Å^2)	
abs	32.145	**real**	5.672	**coh**	0.347	**real**	33.254
abs+incoh	19.672	**imag**	-0.000	**abs**	0.031	**imag**	-0.385
abs+incoh+coh	2.516	**incoh**	1.353	**incoh**	0.020		

Neutron transmission is 0.00% for 10000 cm of sample (after absorption and incoherent scattering).
Transmitted flux is 1.705e-213 n/cm^2/s for a 1e8 n/cm^2/s beam.
Contrast match point: 89.7% D_2O by volume (real SLD = 5.672×10^{-6}/Å^2)

Scattering from LiF

Source neutrons: 5.183 Å = 3.05 meV = 763 m/s
Source X-rays: 1.542 Å = 8.042 keV
Sample in beam: LiF at 2.64 g/cm^3

1/e penetration depth (cm)		Scattering length density (10^{-6}/Å^2)		Scattering cross section (1/cm)		X-ray SLD (10^{-6}/Å^2)	
abs	0.080	**real**	2.301	**coh**	0.054	**real**	20.858
abs+incoh	0.079	**imag**	-0.012	**abs**	12.458	**imag**	-0.096
abs+incoh+coh	0.078	**incoh**	5.188	**incoh**	0.276		

Neutron transmission is 0.00% for 10000 cm of sample (after absorption and incoherent scattering).
Transmitted flux is 0.000 n/cm^2/s for a 1e8 n/cm^2/s beam.
Contrast match point: 41.2% D_2O by volume (real SLD = 2.301×10^{-6}/Å^2)

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